

Application No.: 10/812,431

Final Office Action dated: December 29, 2006

Response to Final Office Action dated: January 9, 2007

In the Claims:

1. (Currently Amended) A control system for a heating system including a combustion chamber, a thermostat, an igniter, an air blower, and a fuel pump, the control system comprising:

at least one ultraviolet (UV) sensor configured to be positioned adjacent to a combustion flame source producing a combustion flame in the combustion chamber of the heating system for generating analog signals indicative of the quality of the combustion flame including carbon dioxide content based on the characteristics of UV light generated by the combustion flame;

means communicating with the at least one UV sensor for converting the analog signals into digital signals indicative of the quality of the combustion flame including carbon dioxide content based on the characteristics of UV light generated by the combustion flame;

means for performing numerical and logical operations on the digital signals, so as to result in data that precisely correlates in a linear fashion with the carbon dioxide content in the combustion gases; and

means for tracking changes in the flame quality from an initial setup optimal value, as correlated with the data of the carbon dioxide content of the combustion gases.

2. (Original) A control system as defined in claim 1, wherein the digital signals include control signals for regulating the quality of the combustion flame.

3. (Original) A control signal as defined in claim 2, wherein the control signals are for regulating the on and off operation of at least one of the igniter, the fuel valve, the air blower and the fuel pump.

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4. (Original) A control system as defined in claim 1, wherein the communicating means and the performing means is a microcontroller.
5. (Previously Presented) A control system as defined in claim 1, wherein the performing means is configured for determining from the digital signals the highest intensity frequencies of UV light generated by the combustion flame.
6. (Previously Presented) A control system as defined in claim 1, wherein the performing means is configured for determining from the digital signals the average intensity of UV light generated by the combustion flame.

Claims 7-44 (Canceled)